

Free Cooling....

Temperatures are beginning to climb and thoughts of iced tea and shady riverbanks are not far away. Most of us won't be able to take advantage of that method of staying cool during the workweek, however. But there is another source of cooling most of our buildings use that, while not quite as pleasant, is healthy, all-natural and almost free. Simple as it may sound, that source is Cool Air!

There are actually **four varieties of free cooling in use in City buildings**. One of these is very common in the Heating, Ventilation and Air Conditioning (HVAC) industry. Two other types are a little more unusual. The last one is downright trendy, and of ancient origin, at the same time.

The first type is called “economizer” cooling. This means that when a building is too warm and the thermostat tells the cooling to come on, the system first checks to see if the **air outside is cool enough** to do the job, instead of the machinery. If it is, then fans come on and bring that cool air inside. Fans are much cheaper to run than air conditioning equipment, such as chillers and heat pumps.

Unfortunately, we have some buildings that were designed to bring in enough air for good ventilation, **but not enough air for economizer cooling** which needs a lot more. At one of these buildings, the Atrium, we were able to find a good solution. “Waterside Economizer” is a fancy name for evaporating water to provide some cooling, not unlike the concept behind the swamp cooler. In most buildings the heat is first removed by the air conditioning equipment and then rejected by evaporating water in a cooling tower. At the Atrium, we make the cooling tower do double duty. When it's cool enough outside, we use the water directly to cool the building. When it's not, we then use the machinery.

Many of us use “Night Flush Cooling” at home every summer. In contrast to “Economizer Cooling” where we use cool air only if it's available when we are too warm during the day, with “Night Flush Cooling”, **we bring in cool air all night long**, even though there is nobody there who needs to be kept comfortable. At Sheldon Community Center, we are using the building to store “coolth”—which means it will be a little chilly in the mornings...but will stay cooler longer providing we keep the heat out as much as possible by keeping doors, windows and blinds closed as the day heats up.

Finally—“Natural Ventilation” uses almost no energy at all! This is one of the new, old ideas that is fast becoming part of the Sustainable Building movement. Before the advent of mechanical air conditioning, buildings were often designed with atria in the center. Not only did these bring daylight into the middle of the building, but they used **the chimney effect** to pull air through. We are trying out a version of “Natural Ventilation” this summer at Petersen Barn. We will install additional vents down low and high on the barn roof, along with small fans and simple controls. We'll be relying primarily on the chimney effect, but the fans will help if needed. We should be able to keep Petersen Barn more comfortable using very little energy and without buying any new air conditioners.